

Public Land Management Agencies' and Nonindustrial Private Forest Landowners' Perceptions towards Ecosystem Services¹

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The state of Florida has more than 16 million acres of forestland (Figure 1). From clean air to pulp for paper to aesthetic landscapes, humans benefit from private and public forests in many different ways. However, small private landowners (e.g., family forest owners) and public land management agencies (e.g., national forests and state parks) manage the majority of this land, and it is up to these people to decide how society will benefit from those forests.

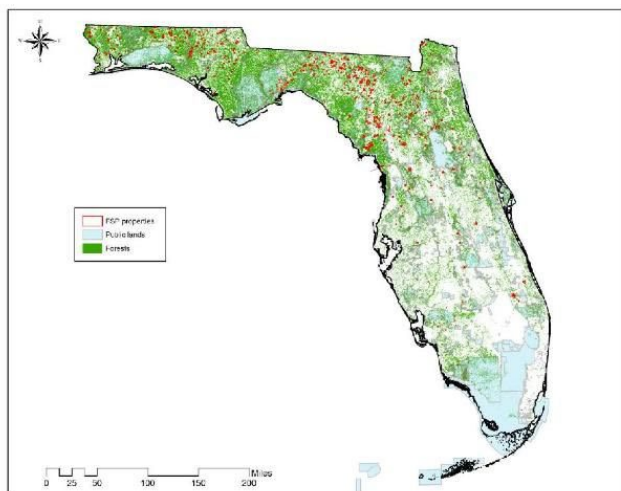


Figure 1. Location of Public and Forest Stewardship Program (FSP) Forests in Florida.

Although a variety of authors have written on the topic of ecosystem services, this report considers ecosystem services to be "the components of forests that are directly enjoyed, consumed, or used to produce specific, measurable human benefits" (Escobedo et al. 2012, p. 11). This paper uses the concept of *ecosystem services* to explore the reasons why public land management agencies and private landowners manage their forests. With a better understanding of how managers perceive ecosystem services, policy makers can develop effective and efficient strategies to assist land managers in providing a wealth of ecosystem services. For example, they can develop incentives to help prioritize services that are not listed as important or develop policies that require the

management of specific services. Also, educators (e.g., extension agents) can better deliver programs to teach forest managers how to effectively manage for the wealth of ecosystem services, as well as alert them to ecosystem services that they had previously not considered as services their forests provide or important services that only come from their forests.

Similar studies from the Southeast have found that forest landowners have positive attitudes about ecosystem services. In Texas, beauty/scenery, investment, income, and "part of my home" were found to be the primary reasons, in order of importance, for owning forestland (Simpson and Yanshu 2010). A study of Georgia's forest landowners found that a significant percentage use their land for recreation (up to 48% depending on location) and appreciate the ecosystem services produced by their property (Moore et al. 2011). In addition, a national poll on ecosystem services in the US found that 90% of respondents view nature's benefits for people (i.e., ecosystem services) as extremely or very important (The Nature Conservancy 2010).

Surveys

In 2011, different statewide surveys were sent to two groups who manage forests in the state of Florida: private landowners and public land decision-makers. The surveys asked a variety of questions about specific ecosystem services (de Groot et al. 2002). The first group consisted of public land management agency decision-makers from the local to the federal level. Researchers attempted to survey every major public land management agency in Florida. Twenty-seven agencies were contacted and 23 responded for an 85.2% response rate. Respondents were asked to identify their agencies' highest priority ecosystem services. The private forest landowners group consisted of nonindustrial private forest (NIPF) landowners contacted through the University of Florida's (UF) Florida Forest Stewardship Program. In all, 527 NIPF landowners were contacted and 194 responded to the survey for a 36.8%

response rate. These respondents were asked to rank ecosystem services by importance. They were also asked about their knowledge of ecosystem services such as biodiversity, carbon sequestration, and recreation opportunities on their property (for a full description of the methods, please see Escobedo et al. 2012).

Public Land Management Agencies

Recreation and scenery were important to both forest management groups. Representatives of Florida's public land management agencies ranked "environmental quality for recreation opportunities" and "enjoyment of scenery" in the top five highest priorities for their agencies. Ecosystem services in the "other" category that were ranked as high priority included habitat conservation and management, timber, water quality, and biological diversity (see Table 1).

Non-Industrial Private Forest Landowners

Most NIPF landowners were generally familiar with ecosystem-related concepts such as wildlife habitat (77.3%), water quality (60.9%), and biodiversity (59.1%). However, many respondents were not familiar with the term "ecosystem services" (43.0%) or specific ecosystem service concepts such as "carbon sequestration," defined as the storage of carbon in trees and plants (45.9%) (Table 2).

Like public land managers, the majority of NIPF landowners reported that the enjoyment of scenery was an important ecosystem service (84.5%). They also highly ranked quality of drinking water (75.0%) and overall environmental quality for recreation opportunities (72.8%) (see Table 3).

The majority of NIPF landowners did not value ecosystem services such as crop/agricultural production (51.7%), water used for crop irrigation (64.3%), and drugs and pharmaceuticals (74.3%) (Table 4). These results do show that forest landowners are not looking to their forests for products not traditionally produced in forests (e.g., agricultural goods or non-timber forest products). Also, although carbon storage is a commonly discussed ecosystem service in the academic world, this study shows that it is not an important service for private landowners.

Most private landowners listed important reasons for owning forested land as the enjoyment of beauty and the protection of nature (87.3%) and participation in their own recreation activities (65.5%). Only 37.7% of respondents indicated that the generation of income from timber or hunting leases was an important reason for owning forested land (see Table 5).

Finally, the survey asked NIPF landowners how they used their land for recreational activities. Most respondents

reported that they use their land for recreational purposes several days a month or more (61.9%). The most frequently reported recreational activities included viewing wildlife (86.5%), walking or day hiking (83.7%), and viewing scenery (77.3%) (Table 6). When asked why they used their land in this way, the most common responses were that respondents enjoyed being close to nature (85.7%) and that they enjoyed the scenery (83.3%). Many respondents reported that they used their land for recreational purposes to escape the usual demands of life (75.4%) (Table 7).

Discussion and Key Management Recommendations

Representatives of Florida's public land management agencies prioritized recreation, scenery, and timber, but did not rate other ecosystem services such as carbon sequestration, non-timber forest products, prevention of damage from erosion and sedimentation, or pollution control, as important priorities. Although NIPF landowners considered a variety of ecosystem services to be important, they also focused on traditional uses of private land such as recreation and timber. Like the public land managers, these respondents did not rank carbon sequestration or non-timber products highly. These findings are consistent with a study in Texas, which found that forest owners prioritized beauty and scenery as a top priority ecosystem service (Simpson and Yashu 2010). They are also similar to a significant percentage of Georgia landowners who used their land for recreation (Moore et al. 2011).

Landowners might consider certain services important, but they might not have the best knowledge or ability to provide for those services. Therefore, future management, policies, and education programs can emphasize the efficient and effective management strategies that focus on these services. For example, both groups of respondents listed water-related ecosystem services as important, but balancing water quality with other forest management techniques (e.g., harvesting and applying herbicides and pesticides) requires a thorough knowledge of specific management strategies. Therefore, policies and educational programs could be developed to better manage forest lands to protect water quality.

Management and educational programs can also raise awareness and knowledge about lesser known or recognized ecosystem services. For example, the variety of ecosystem services used in this and other ecosystem service studies (de Groot et al., 2002; Escobedo et al. 2012) are unfamiliar or not of high importance to Florida public and private forest managers (e.g., pollination, medicinal plants, and non-timber forest projects), but they still can and do provide important benefits to society. Through innovative forest management, landowners can manage for these *new* services while simultaneously improving their management for identified priority services (e.g.,

recreation, aesthetics, and water quality). For example, an educational program focused on recreation and aesthetics could also discuss how planting native groundcover vegetation is not only aesthetic, but also provides habitat for butterflies (i.e., pollinators) or could make a profit for the landowner through selling wildflower seeds (i.e., non-timber forest products). Finally, managing forests for carbon storage is a global issue, and it will likely affect the assessment of forest values in the near future, but Florida land managers do not treat it with high importance. Educational programs should bring this service to landowners' attention by explaining the concept and how it might affect their land management decision-making.

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Table 1. Florida Land Management Agencies' Top Five Ecosystem Service Priorities.

Answer Options	First Priority	Second Priority	Third Priority	Fourth Priority	Fifth Priority
Overall environmental quality for recreation opportunities	40.9% (9)	13.6% (3)	22.7% (5)	9.1% (2)	4.5% (1)
Enjoyment of scenery	0.0%	13.6% (3)	9.1% (2)	22.7% (5)	13.6% (3)
Other	36.4% (8)	31.8% (7)	31.8% (7)	18.2% (4)	27.3% (6)
Total Responses	22	22	22	22	22

Note: (#) is the number of respondents; the "Other" category included write in responses such as: education/awareness, prescribed burn, recreation, biological diversity, habitat conservation and management, land regulations, and water.

Table 2. Nonindustrial Private Forest Landowners' Familiarity with Ecosystem Service Concepts in Florida.

Management Activity Concept	Number of Respondents	Not Familiar	Neutral	Familiar
Wildlife habitat	150	11.3%	11.3%	77.3%
Water quality	151	13.9%	25.2%	60.9%
Biodiversity	149	22.8%	18.1%	59.1%
Ecosystem services	151	43.0%	22.5%	34.4%
Carbon storage	148	45.9%	28.4%	25.7%

Table 3. Most Important Ecosystem Services when Managing Private Forest Lands in Florida.

Reasons for Owning Forested Land	Number of Respondents	Not Important	Neutral	Important
Enjoyment of scenery	148	5.4%	10.1%	84.5%
Quality of drinking water	148	12.2%	12.8%	75.0%
Overall environmental quality for recreation opportunities	147	11.6%	15.6%	72.8%
Timber	148	12.8%	15.5%	71.6%
Biodiversity of plant and animal species	148	10.8%	23.0%	66.2%

Table 4. Least Important Ecosystem Services when Managing Private Forest Lands in Florida.

Reasons for Owning Forested Land	Number of Respondents	Not Important	Neutral	Important
Carbon storage to mitigate global climate change	145	43.4%	20.7%	35.9%
Non-timber forest products	145	48.3%	22.1%	29.7%
Crop/agricultural production	143	51.7%	16.1%	32.2%
Water used for crop irrigation	143	64.3%	14.7%	21.0%
Drugs and pharmaceuticals	145	74.5%	15.9%	9.7%

Table 5. Nonindustrial Private Forest Landowners' Reasons for Owning Forested Land in Florida.

Reasons for Owning Forested Land	Number of Respondents	Not Important	Neutral	Important
Enjoy beauty/protect nature	150	5.3%	7.3%	87.3%
Participate in your own recreation activities	148	21.6%	12.8%	65.5%
Generate income from timber or hunting leases	151	48.3%	13.9%	37.7%

Table 6. Nonindustrial Private Forest Landowners' Participation in Recreation Activities in the State of Florida.

Statement	Sample Size	Label	Percentage of Respondents
Recreation activities on your land	150	Viewing wildlife	86.5
		Walking or day hiking	83.7
		Viewing scenery	77.3

Table 7. Nonindustrial Private Forest Landowners' Reasons for Using Their Land in Florida.

Reasons for Recreating on Their Property	Sample Size	Not Important	Neutral	Important
To be close to nature	140	5.0%	9.3%	85.7%
To enjoy the scenery	138	5.8%	10.9%	83.3%
To get away from the usual demands of life	138	10.9%	13.8%	75.4%

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